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# OBSERVATIONS UPON THE PLACENTA AND YOUNG OF DASYPUS SEXCINCTUS.

BY HENRY C. CHAPMAN, M. D.

The Edentata, so called by Cuvier on account of the teeth being so imperfectly developed or absent in the representatives of the order, includes a very heterogeneous assemblage of animals—ant-eaters, sloths, armadillos—differing very much in their internal organization, especially in the character of their placentation. Thus the placenta in the Cape ant-eater, *Orycturopus*, is deciduous and, according to some authorities,[1] discoidal, to others[2] zonular in form. In the Tamandua, *T. tetradactyla*, it is possibly deciduous and discoidal;[3] in the sloths, *Cholœpus Hoffmanni*, it is deciduous and loboid in form;[4] in the Pangolin, *Manis*, ? non-deciduous and diffuse;[5] in certain species of armadillos, *e. g. Dasypus novemcinctus*, possibly deciduous and discoidal.[6]

In view of the fact that such profound differences exist in the placentation of the Edentata, it is hoped that the following observations upon the placenta and young of the six-banded armadillo born in the Philadelphia Zoological Garden and submitted to the author for examination by Mr. A. E. Brown, Secretary of the Society, will prove acceptable. It should be mentioned in this connection that in the case of the placenta of *Dasypus novemcinctus* as described by Milne-Edwards,[7] four fœtuses were found enclosed in one chorion. Such a disposition, far from being an abnormal one, would seem to be that usually obtaining, at least in that species of armadillo, since the same number of fœtuses were observed enclosed in a common chorion by Kölliker[8] before, and by Duges[9] after Milne-Edwards' observations. Different explanations have been offered by anatomists of this apparent anomaly of one chorion enclosing a number of fœtuses. The most satisfactory as yet offered, though hypothetical, the early development of the armadillo being unknown, is that originally the number of chorions correspond to the number of fœtuses, but that as development advances the adjacent walls of the primitively distinct chorions fuse together and ultimately break down, the result being the formation of one chorion. In the case of the six-banded armadillo, *Dasypus sexcinctus*, the mother gave birth to but one young, and there were no reasons for supposing that more than one was developed during the pregnancy.

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[1] T. H. Huxley, *Introduction to the Classification of Animals*, London, 1869, pp. 98, 104.

[2] W. Turner, *Journal of Anat. and Phys.*, Vol. 10, 1876, p. 693.

[3] A. Milne-Edwards, *Ann. des Sciences Nat.*, Cinquième Série, Zool., XV, 1872, p. 2.

[4] W. Turner, *Trans. Royal Society of Edinburgh*, Vol. XXVII, 1876, pp. 76, 78.

[5] T. H. Huxley, *op. cit.*, p. 104.

[6] Alph. Milne-Edwards, *Annales des Sciences Naturelles*, Sixième Série, Zoologie, VIII, 1879, pp. 2, 3.

[7] *Op. cit.*, p. 2.

The young armadillo (Plate XVIII, fig. 1), the first born at the Philadelphia Zoological Garden, a male which lived but a few hours, was perfectly developed and measured from snout to end of tail 25 centimeters (10 inches). The most striking feature of the young animal externally was the size of the penis, it measuring 3.7 centimeters (1.5 inches). It is well known that this organ attains an enormous size in the adult armadillo, absolutely as well as relatively. Six distinct broad bands and two indistinct narrow ones were observed on the dorsal surface, but they were as yet soft to the touch.

No trace was found of an umbilical vesicle, amnion, or any part of the chorion except that entering into the formation of the placenta. The umbilical cord measured 22.5 centimeters (9 inches), the vessels not being spirally disposed, as was also observed by Milne-Edwards to be the case in the Tamandua. The umbilical vessels were so much torn (having been apparently gnawed by the mother) as to make it impossible to inspect the placenta through them. A mixture of gelatine and carmine was, however, forced directly into a few of the small vessels of the placenta, which consisted of the villous processes of the chorion only, without admixture of any maternal tissue, and was therefore non-deciduate. The fœtal villi were disposed as a girdle or zone (Plate XVIII, fig. 2) on that part of the chorion in contact with the uterus. The zone measured from outer edge to outer edge about 5 centimeters (2 inches), the average breadth of the rim of the zone 1.2 centimeters (.5 inch), the breadth of the space between the inner edges of the zone and destitute of villi 2.5 centimeters (1 inch). The placenta in the six-banded armadillo is not, however, a zonular one in the sense in which that word is used by anatomists. It does not surround the chorion as a broad band, the poles of the latter being bare as in the " diffuse " non-deciduate placenta of the pig ; nor as a narrow one as in the " zonular " deciduous placenta of the Carnivora, etc. It should be regarded morphologically rather as a discoidal placenta, the central portion of the disk—that is, the part of the chorion lying within the inner edges of the rims of the villous zone—presenting, however, no villi. The placenta in *Dasypus sexcinctus* being therefore ring-shaped, rather than discoid in form, if it be permitted to introduce a new name in anatomical nomenclature, it might be described as a non-deciduate cricoid placenta.[10] The villi, measuring on an average 20 mm. (.8 inch), were not simple as in the Pachydermata, Camelidæ and Tragulidæ, but compound as in Man. They presented a beautiful arborescent appearance (Plate XVIII, fig. 3), the terminal twigs ending in bulbous or rounded extremities (fig. 4). As is well known, Von Baer,[11] Eschricht,[12] the elder Milne-Edwards,[13] Huxley,[14] and in recent times Haeckel,[15] advocated classifying the monodelphous mammalia according to the character of the placentation. It is obvious, however, as shown by the summary given below, that on such a basis the different members of the Edentata would be associated with mammals with which they have no natural affinities, just as, according to such classification, totally different animals like the Hyrax, Elephant, and Carnivora are associated, and which constitutes one of the most important objections that have been urged to the acceptance of such classification.

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[8] *Entwicklungsgeschichte des Menschen*, 1879, S. 362.

[9] *Annales des Sciences Naturelles*, Sixième Sér., Zoologie, IX, 1879-80, p. 1.

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[10] Κρικος, a ring.

[11] *Untersuchungen über die Gefässverbindung zwischen, Mutter und Frucht*, 1828.

[12] *De Organis quæ Respiratione et Nutritioni Fœtus Mammalium inserviunt*, 1837.

[13] *Annales des Sciences Naturelles*, Série 3, Tome I, 1844, p. 65.

[14] *Elements of Comparative Anatomy*, p. 112.

[15] *Anthropogenie*, 1891, S. 591.

- Placenta
  - Deciduous
    - Discoidal
      - Primates, etc.
      - Bradypus.
    - Zonular
      - Elephant.
      - Carnivora.
      - Orycteropus.
  - Non-deciduous
    - Diffuse
      - Sus.
      - Manis.
    - Cotyledonary
      - Bos.
      - Ovis.
    - Cricoid
      - Dasypus sexcinctus.
    - Discoidal
      - Dasypus novemcinctus.[16]
      - Tamandua tridactyla.[16]

## EXPLANATION OF PLATE XVIII.

Fig. 1.—Young Armadillo and fœtal face of placenta.
Fig. 2.—Uterine face of placenta.
Fig. 3.—A villous process of the chorion.
Fig. 4.—A portion of the same as seen when magnified.

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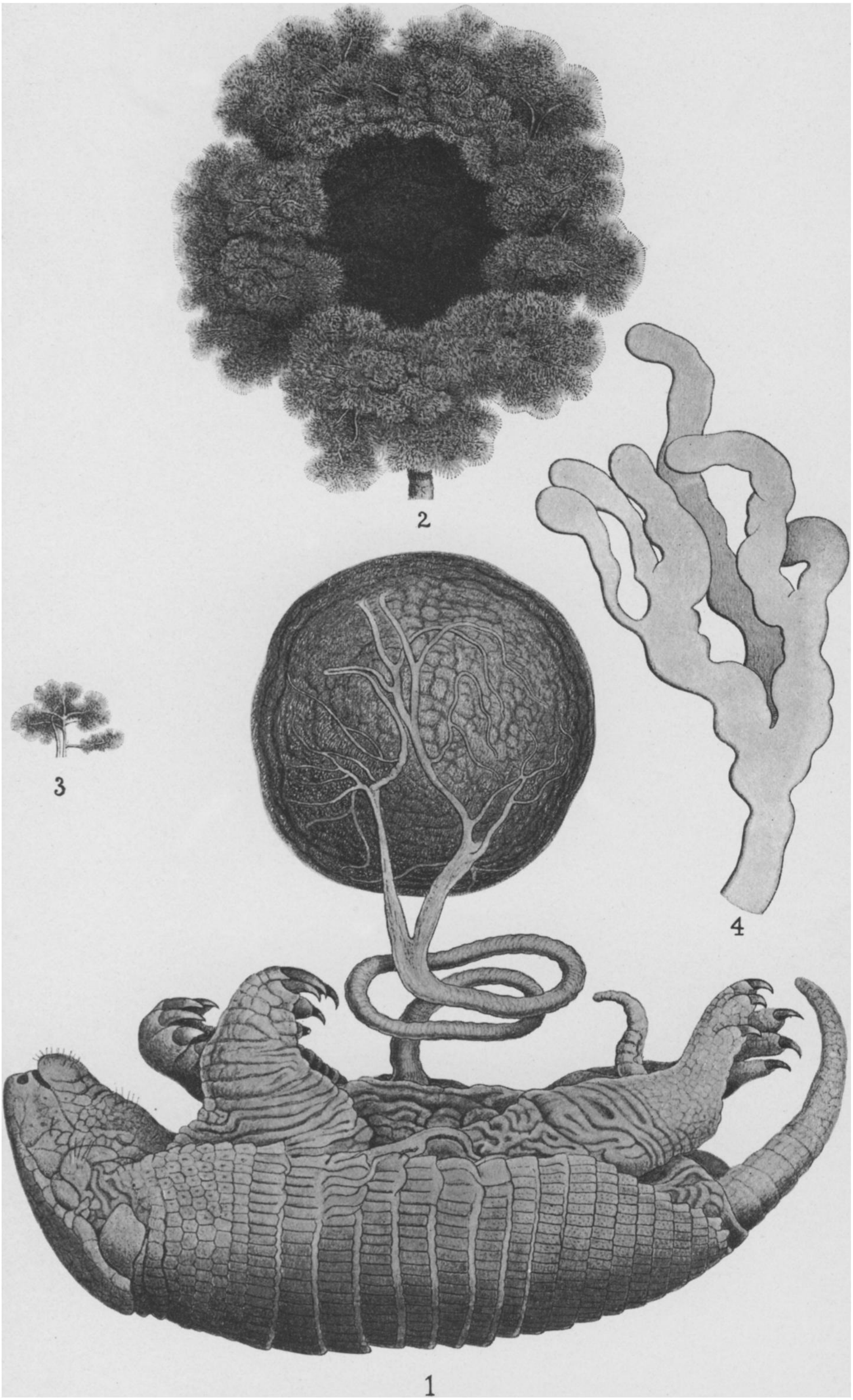
[16] Incertum sedis.



CHAPMAN ON DASYPUS SEXCINCTUS.